Advanced Technology Division

Aviation Maintenance Technician Unit Plan

Lane Community College

Revised 3/16/05

Advanced Technology Division

Aviation Maintenance Technology Unit Plan

Alignment with the College

Aviation Maintenance Technology is a credit instructional program and has been offered at Lane Community College since 1964. The program is administered under the Office of Instruction and Student Services through the Advanced Technology Division.

Aviation Maintenance Technology program is centrally aligned with the College's strategic directions, core values, and learning centered principles.

Strategic Directions

Achieve Financial Stability:

Enhance the College Climate: This program actively recruited students from under-represented populations.

Core Values

Learning: Learning is both theoretical and applied. Student learning progresses from basic to advanced technical, academic and employability skills.

Diversity and Accessibility: The program faculty welcome students from diverse backgrounds. Students with special needs are accommodated with appropriate supplemental learning technologies and experiences.

Innovation: Faculty maintain their expertise in the field and incorporate advanced technologies in the curriculum. The faculty has made a commitment to maximize the use of innovative instructional technologies to transform the curriculum. Some examples of this include transferring lecture notes to PowerPoint and assisting the division in developing a technical common core curriculum.

Collaboration and Partnership: The faculty work very closely with their program advisory committee. This committee is a representation of active community business partners who provide advice and program support. The Aviation Maintenance faculty also work very closely with other divisional programs, especially Diesel Technology and Automotive Body and Collision.

Integrity: The program faculty have demonstrated a high degree of integrity. They are openly accountable to perform according to the policies, procedures and expectations of the College, the division, the advisory committee, and most importantly, the students.

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Learning Centered Principles

Substantive Change in Individual Learners: The Aviation Maintenance Technology program excels in transforming student lives. This transformation is demonstrated when a new student enters the program without entry level skills and can complete the two-year program to obtain a high-wage career in the Aviation industry.

Document Learning Success: As students progress through the program, they obtain the required training to pass three Federal Aviation Administration (FAA) written examinations..

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Unit Description

The Aviation Maintenance Technician program is an occupational, preparatory, two-year Associate of Applied Science degree and/or a two-year certificate of completion program.

The Aviation Maintenance Technician program is approved under part 147 of the Federal Aviation Regulations of the Federal Aviation Administration. FAA oral, practical and written certification exams are required. The program features state-of-the-art laboratories where students learn how to diagnose and repair the operating condition of aircraft using advanced diagnostic tools and equipment. The advanced equipment and expertise of the faculty make Lane's Aviation Maintenance Technician program the best way to enter the field.

Faculty in the program bring considerable field experience to the classroom and regularly attend workshops at manufacturer training centers to help them keep up with technological changes in the industry.

The program provides classroom instruction, considerable hands-on training on aircraft in the laboratories, and technical field experience that prepares you for employment in the aviation maintenance field. Program course work includes: airframe -1150 hours (400 general plus 750 airframe); powerplant - 1150 hours (400 general plus 750 powerplant); combined airframe and powerplant – 1900 hours (400 general plus 750 airframe and 750 powerplant).

Graduates of this program begin careers as Aviation Maintenance technician working at company-owned repair stations, airports

This training can lead to employment in entry occupations in the aviation maintenance field earning approximately $44,600 annually. Employment opportunities are favorable for trained aircraft mechanics and annual new openings are expected to be much higher than average.

New students can enter the program at the beginning of fall or winter terms. For consent to enroll in major courses students must attend a program orientation in fall terms (dates available in counseling or the Students First! Center) or contact the department advisor/counselor in winter and spring terms). All interested applicants should complete placement testing (Assessment & Testing Office, Building 1) in reading, writing and math. Take testing results to the program orientation and/or advisor/counselor for assistance with course selections. Restricted facilities limit the number of students admitted to this program. Students are selected on a first-come, first-served basis by or date of application to this program.

History/Significant Program Events

This program has been offered at the college since 1938.

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Aviation Maintenance Technology Unit Plan

Degrees and Certificates

Two-Year Associate of Applied Science Degree	**Credits**
AAS Program Total	**109 - 112**
First Year	
Fall	
General 102 AV 193	6
General 103 AV 194	6
Workplace Safety HE 125 or First Aid HE 252 or PE/Health requirement	3
Total Credits	**15**
Winter	
General 101 AV 192	6
General 104 AV 195	6
General 105 AV 196	6
Applied Algebra for Technicians MTH 086 or higher	4
Total Credits	**22**
Spring	
Powerplant (Section 1, 3, & 4) AV 281	18
Total Credits	**18**
Second Year	
Fall	
Powerplant (Section 2) AV 281	6
Airframe (Section 3 & 4) AV 279	12
Total Credits	**18**
Winter	
Airframe (Section 2) AV 279	6
Powerplant Return to Service AV 283	6
Science/Math/Computer Science requirement	3
Introduction to College Writing: Workplace Emphasis WR 115W or higher	3
Total Credits	**18**
Spring	
Airframe (Section 1) AV 279	6
Airframe Return to Service AV 282	6
Arts/Letters requirement	3
Human Relations requirement	3
Cooperative Education: Aviation Maintenance AV 280 (optional	3
Total Credits	**18-21**

Students interested in completing the FAA Airway Science requirements for two-year institutions should substitute:

- English Composition: Exposition & Introduction to Argument WR 121 for Introduction to
- College Writing: Workplace Emphasis WR 115W.
- Fundamentals of Public Speaking SP 111 for Arts/Letters requirement.
- College Algebra MTH 111 for Science/Math/Computer Science requirement.

Add:

- Technical Report Writing WR 227
- Public Relations J 205
- Fundamentals of Physics PH 101 or PH 102
- Business and Professional Speech SP 130
- Any 200 level Psychology course (3 credits)
- General Aviation AV 179

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Two-Year Certificate of Completion	**Credits**
Certificate of Completion Total	**103-106**
First Year	
Fall	
General 102 AV 193	6
General 103 AV 194	6
Workplace Safety HE 125 or First Aid HE 252 or PE/Health requirement	3
Total Credits	**15**
Winter	
General 101 AV 192	6
General 104 AV 195	6
General 105 AV 196	6
Applied Algebra for Technicians MTH 086 or higher	4
Total Credits	**22**
Spring	
Powerplant (Section 1, 3, & 4) AV 281	18
Total Credits	**18**
Second Year	
Fall	
Powerplant (Section 2) AV 281	6
Airframe (Section 3 & 4) AV 279	12
Total Credits	**18**
Winter	
Airframe (Section 2) AV 279	6
Powerplant Return to Service AV 283	6
Introduction to College Writing: Workplace Emphasis WR 115W or higher	3
Total Credits	**15**
Spring	
Airframe (Section 1) AV 279	6
Airframe Return to Service AV 282	6
Human Relations requirement	3
Cooperative Education: Aviation Maintenance AV 280 (optional	3
Total Credits	**15-18**

Cooperative Education

Cooperative Education (Co-op) offers students college credit and a grade for on-the-job work experience related to their educational and career goals. Through Co-op a student can integrate theory and practice, develop skills, expand career knowledge, and make contacts for the future. Work schedules and work sites vary. Under the supervision of the Aviation Maintenance Cooperative Education Coordinator and as approved by the FAA Liaison and Return to Service instructor, a maximum of 6 Co-op credits in AV 280 may be authorized in lieu of the final Return to Service course. Co-op may be taken summer term.

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Aviation Maintenance Technology Unit Plan

Organizational Structure

Board of Education
President
Vice President of Instruction
Associate Vice President of Instruction
Division Chair Advanced Technology
Faculty Aviation Maintenance Technology Program

Faculty/Staff

Name	***Cliff Guse***
Classification	Full-Time Faculty
Year Hired	2000
Degrees/Credentials	

Name	***Brian McGlynn***
Classification	Full-Time Faculty
Year Hired	2000
Degrees/Credentials	

Name	***Keith Bird***
Classification	Full-Time Faculty
Year Hired	
Degrees/Credentials	

Program Outcomes

Program Outcomes: The Aircraft Maintenance Program has a tradition of excellence with a long history. Aircraft Airframe and Powerplants (A & P) program has evolved from the program founded in 1938 as a part of the old Eugene Vocational School. During WWII, the Eugene based A& P program was a major source of well trained mechanics and trainers for military aviation crucial for national defense.

Projected growth in the aviation industry, globally, portends a major increased need for well trained technicians. During the ten year period extending through the year 2012, the projected need is for 150,000 mechanics in the domestic aviation industry. Program objectives is to provide very high quality training assuring every graduate is prepared to compete successfully in the job market. Each graduate will have qualified for the coveted Airframe and Powerplants technician certificates issued by the FAA. Training standards and practices will assure that each graduate entering the workforce will have the knowledge, skills and experience to perform well above industry standards.

Accreditation Standards: Each student graduating from the instructional program will exit prepared to qualify for their FAA issued certificates as Airframe and Powerplants maintenance technicians. Further, each graduate will have the technical skills to significantly benefit from continued professional training throughout their careers.

Course Instructional Methods: All course listed below are presented in a formal classroom lecture format using printed materials, video and overhead transparencies. Classroom instruction is augmented with lab projects by instructional unit.

Course Outcomes**:** Each participant will successfully complete written test instruments and lab projects.

AV 179 – General Aviation
AV 192 – General 101
AV 193 – General 102
AV 194 – General 103
AV 195 – General 104
AV 196 – General 105
AV 179 – Airframe
AV 281 – Powerplant
AV 282 – Airframe Return to Service
AV 283 – Powerplant Return to Service
AV 289 – Helicopter Maintenance

Advisory Committee:
The Advisory Committee meets once each term. Advisory Committee membership includes people from the aviation industry, retired college faculty and retired members from the community having a general interest in aviation. The committee membership is composed of a relatively large number of emeritus participants.

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Program Review Status: The current A & P program has been very successful in terms of having essentially a 100 percent placement rate for those candidates completing the program and having earned their A & P license.

There are a number of needs that must be addressed to assure long-term viability and to assure training provided by the program is consistent with industry standards and technology trends.

1. The fiscal base must be secured,
2. there is a very real need for aggressive promotion and marketing: enrollments are too low considering industry needs, current capacity and efficient use of facilities,
3. lab equipment and teaching aids need to reflect continuing industry standards,
4. there is a need to incorporate more composite materials training,
5. as a community college, there is a need to have enough additional capacity in the instructional system to accommodate needs and interests represented in the general community.

Program Operating Information - Trends

Performance Analysis

Performance Assessment Methods:
Multiple levels and multiple assessment instruments are used to determine instructional / learning effectiveness.

Academic Assessments, General Ed. Courses:
Academic performance is assessed via earned course grades; grades are compiled from performance on written test instruments and lab projects, and other devices as appropriate for the course.

Academic Assessment, aviation specific courses:
Academic and applicable knowledge is assessed by the use of written test instruments, oral examinations and associated lab projects.

FAA Written Test Instruments:
The Federal Aviation Agency (FAA) is the ultimate authority relative to qualification for and issuance of aviation related certificates (licenses). Evidence of the attainment of required knowledge is the successful completion of the FAA written examination.

End-of –Training Final Stage (certification testing):
An applicant for an FAA aircraft Airframe and Powerplant Mechanic's certificate must satisfactorily complete each of the following elements:

a) must possess evidence of satisfactory completion of the appropriate FAA written examination,
b) successful completion of an oral examination,
c) successful completion of a practical examination representing knowledge and skills appropriate to industry standards.

Post graduation tracking:
Tracking employment history after graduation from the program provides useful information relative to effectiveness of the training program and useful information as to industry trends and needs for making program changes and course offerings as well as delivery systems.

Operating Improvement (Enrollment Management):
Issues involving national security and college budget issues have adversely impacted the aviation maintenance program. Staffing has been reduced and sections limited.

Near term tasks include consolidation of all aviation maintenance programs in the RTS (Return To Service) facilities on the airport before the beginning of the fall term 2004. All courses offered by or required by the Aircraft Maintenance program are to be reviewed for content and modes of delivery. The objective is to improve instructional effectiveness and efficiency. All course content and individual courses are to be reviewed for consistency with FAA and industry requirements.

An increased effort is being expended to increase a working relationship with industry partners to improve access to instructional support. There is a need for current technology teaching equipment, such as engines, composite airframe structures and current technology aircraft systems. As the industry becomes increasingly sophisticated, there will be an increased need for internship opportunities.

There is a significant need for a substantially expanded marketing plan.
Enrollment numbers must be increased. Currently, the following are examples of the expanded marketing effort:

a) developing working partnerships with other community college in the state system,
b) increased direct interaction with the high schools,
c) working with the Oregon Economic Development people, and
d) expanding marketing effort to more actively recruit veterans.

Unit Initiatives

Unit initiatives are separated into two categories: Maintenance Initiatives and Enhancement Initiatives.

Maintenance initiatives are requests for resources to maintain the existing levels of program efficiency and effectiveness. Maintenance initiatives respond to:

1) any mandatory changes in the program (recurring contracts, change in credits, implementing accreditation or other curriculum standards), and,
2) costs to maintain the existing curriculum and program equipment.

Enhancement initiatives are requests for new resources to implement substantive changes in the program, usually in response to student growth or new curriculua.

Maintenance Initiatives

Initiative ID	Need	Request
M01	Ignition systems	17,000
M02	Lubricating systems	5,000
M03	Propellers	50,000
M04	Aircraft manuals upgrades	5,000
M05	Fuel systems	2,000
M06	Finishing systems	25,000
M07	Cabin atmosphere controls	2,500
M08	RTS- General equipment	120,000
M09	Campus sheet metal equip	50,000
M10	Turbine powerplants	167,000
M11	Instrumentation	35,000
M12	Ice & rain control aircraft (2)	300,000
M13	Ice & rain control	15,000
M14	Rigging assembly systems	25,000
M15	PA 28-140 complete	25,000
M16	Cessna 152 - complete	20,000
M17	Cessna 210 - fuselage mock up	4,500
M18	Cessna 310 - complete	30,000
M19	Piper PA 28-151, damaged	10,000
M20	Rockwell T39A, operational	100,000
M21	Hughes 269 Helicopter	10,000
M22	Hiller Helicopter	25,000
M23	Bell UH-1H helicopter	200,000
M24	Cessna 182 - complete	35,000
M25	Hydraulics	25,000
M26	General equipment	20,000
M27	Demonstration engines	80,000
M28	Overhaul equipment	52,000

Enhancement Initiatives

Initiative ID	Need	Request
EO1	Powerpoint Teaching stations (3)	18,000
EO2	Turbocharged Engine systm	18,000
EO3	Curriculum Development	300 hrs
EO4	Engine overhaul stand	2,000
EO5	Upgrade NDT program	10,000
EO6	Instrument test bench	11,000
EO7	King Air Turbo prop aircraft	150,000
EO8	Hydraulics lab	30,000
EO9	60 tables/120 chairs for 4 classrooms	
EO10	Electrical lab & power supplies	4,000
EO11	Student computers (20)	30,000
EO12	Computer laboratory	42,000
EO13	Zetec eddy current	5,000
EO14	Zetech ultrasonic	5,000
EO15	Engine Laboratory	100k 0ver 5yrs

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Aviation Maintenance Technology Unit Plan

Conceptual Report:
A multi-year plan, all included elements to be completed by the year 2008.

Overview:
The ultimate objective is to build a world-class aircraft maintenance technician training program. Elements to include: conventional airframe and power plant technician training that exceeds FAA requirements and is recognized as an industry standard for a vocational/technical school and the option of the 2+2+2 design where high school students have an opportunity to do college course work while still in high school. This allows the student to begin a career path at the high school level, then transfer to the local community college for two years of technical and transfer course work culminating in an A&P certificate from the FAA and the option of continuing on to a four-year university to continue in the air transportation industry in management.

Further – graduates will be skilled in advanced power plants systems including electronic controls systems used on reciprocating engines and small high efficiency turbine engines. Graduates will be familiar with composite structures and digital based controls systems.

Secure composite airframes suitable for teaching materials, fabrication and repair of composites, including fiberglass, carbon fiber and Kevlar based technology materials.

Secure at least two operational turbine engines that can run in a test cell. Preferred engine types are the PT-6 series engines and / or Garrett engines representative of the engine types common to executive transport airplanes.

Secure equipment and materials to develop an electrical systems lab. The lab to be used to teach basic AC and DC systems – generation, regulation, control and distribution systems appropriate to general aviation aircraft.

Secure equipment and materials to develop a fully functional and modularized vacuum / pneumatic teaching lab. Objective is to emulate vacuum and pneumatic systems used on general aviation aircraft.

Secure equipment and materials to develop a fully functional and modularized hydraulics systems lab. Objective is to emulate hydraulic systems common on general aviation aircraft.

Secure equipment and materials to develop a fully functional and modularized digital logic based systems including transducers, actuators and display systems common to airplanes with highly automated systems including EFIS display systems.

a) By 1 June, 2004, have either modular classrooms and lab spaces on location with the RTS facilities on the airport, or

b) the former Helijet building currently on the north end of the airport moved to the location near the RTS facilities. By 2008, have phase II of the original Aviation Maintenance training facilities funded and built.

c) Remodel entrance of the RTS building to include a reception area.

By 1 June, 2004, have at least one industry partner that will actively support a internship program for A&P students.

By 1 September, 2005, have a definable education/career track for A&P students who wish to earn a four-year degree to support professional positions in the air transportation industry or management positions.

Constraints / Barriers:

This discussion will follow the order of the "conceptual report presentation."

There are no reasons for not being able to secure lab materials and airframe structures suitable for providing "technology current" training on a variety of composite materials.

Small turbine engines have been service long enough so operational engines,which are no longer airworthy, can be expected to be available via government or industry surplus. No apparent barriers.

Most major components for an electrical lab are available from surplus supplies. Wiring, control units and miscellaneous components are readilyavailable. Required resources include construction materials and labor to build the lab fixtures. Instructor development resources are required to design the labs and to develop the labs (documents).

Resources required:
a) time resources to design the lab system and lab materials (documents),
b) time resources to locate and secure major components,
c) funds to purchase materials and supplies.

Most major components for a vacuum/pneumatic systems lab may be obtained from government and industrial surplus sources.

Resources required:
a) time resources to design the lab system and lab materials (documents),
b) time resources to locate and secure major components,
c) funds to purchase materials and supplies.

Most major components to develop a fully functional hydraulic systems lab may be obtained from government and industry surplus sources.

Resources required:
a) time resources to design a lab system and lab materials (documents),
b) time resources to locate and secure major components,
c) funds to purchase materials and supplies.

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This project involves development of a system design and the design of labs that involves the use of transducers and electronic controlled actuators. This project involves the integration of digital logic systems and the interface between the digital controllers and the hardware systems in the airplane.

Resources required:
a) time resources to train instructional staff,
b) time resources to design the lab system and the associated labs (documents).
c) time resources to secure appropriate materials and systems sub-sets representative of automated flight systems. Likely sources are equipment manufacturers,
d) Funds to purchase required materials and equipment.

a & b) There is a need to coordinate with campus administration, campus facilities and the City of Eugene for the purpose of determining the feasibility of moving the "Helijet" building. If the Helijet building can be moved and ready for occupancy by the fall of 2004, moving modular classrooms may not be required.

At this juncture, it appears as if funds are likely to be available to cover most of the cost to move the building. Capital fund raising is going to be required to cover the costs associated with erecting the building, connecting utilities and doing the remodeling required to make the building useful as classroom and lab spaces for the Aviation Maintenance and perhaps the Avionics programs.
Depending upon the amount of remodeling and installation of lab facilities in the Helijet building, the cost to move the building and re-erect and prepare the building for use may range from $300,000 to $500,000. It is expected that multiple funds resources must be identified and developed from the community and from college resources.

If Helijet building is not going to be useable by the fall of 2004, then modular classrooms / lab spaces will need to be ready, preferably by 1 June, 2004. The need is to identify suitable modular units and secure funds to place modular units in service on the airport site.

1. Presently, discussions are going on with Evergreen International Airlines to develop an internship program for A&P students. At this point there is no reason to believe the Evergreen plan will not occur.

2. All students at Lane Community College have the option of completing an AAOT. Currently, a working relationship with OSU and Uof O is in place. Options for non-traditional degrees are available from Embry Riddle, Utah Valley State University and Northwest Christian College.

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General Conclusion:

Considering the trends in the industry the future for the Aviation Maintenance programs at Lane, the Lane program can expect a very bright future. Industry forecasts project significant shortages of qualified technicians.

Considering the long and very successful history for the Lane Aviation Maintenance program, it is reasonable to expect a continued high placement rate for Lane graduates.

Two major challenges must be met in order to realize the potential for the program:

a) a significant marketing effort must be made to recruit new students. Enrollments are substantially down from historical levels. Considering current enrollment numbers, program costs are too high and the program cannot expect a long-term future at current levels of enrollment and associated costs to deliver;

b) significant funds are required to provide for additional lab spaces and up-dated instructional equipment.

Division/Unit	Initiative ID	Division Priority	Date of Initiative	Expected completion date	Initiative Description	Resource Description	$$	Recurring / Nonrecurring	Resource Type (mark with an "X")				Funding Sou (mark with an			
									Payroll (w/OPE)	Equipment	Space	Other	Existing	New G-F	CP	TACT
Aviation M	EO1	1	1/9/04	6/30/05	New Equipment	Powerpoint Teaching stations (3)	18,000	NR		x						1
Aviation M	EO2	2	1/9/04	6/30/05	New Equipment	Turbocharged Engine systm	18,000	NR		x				1	1	
Aviation M	EO3	3	1/9/04	6/30/05	New Equipment	Curriculum Development 300 hours	7,500	R	x						2	
Aviation M	EO4	4	1/9/04	6/30/05	New Equipment	Engine overhaul stand	2,000	NR		x					3	
Aviation M	EO5	5	1/9/04	6/30/05	New Equipment	Upgrade NDT program	10,000	R							4	
Aviation M	EO6	6	1/9/04	6/30/05	New Equipment	Instrument test bench	11,000	NR		x					5	
Aviation M	EO7	7	1/9/04	6/30/05	New Equipment	King Air Turbo prop aircraft	150,000	NR		x					6	
Aviation M	EO8	8	1/9/04	6/30/05	New Equipment	Hydraulics lab	30,000	NR		x	x				7	2
Aviation M	EO9	9	1/9/04	6/30/05	New Equipment	60 tables/120 chairs for 4 classrooms	14,500	NR		x	x				8	
Aviation M	EO10	10	1/9/04	6/30/05	New Equipment	Electrical lab & power supplies	4,000	NR		x					9	
Aviation M	EO11	11	1/9/04	6/30/05	New Equipment	Student computers (20)	30,000	NR		x				2	10	3
Aviation M	EO12	12	1/9/04	6/30/05	New Equipment	Computer laboratory	42,000	NR		x	x			3	11	4
Aviation M	EO13	13	1/9/04	6/30/05	New Equipment	Zetec eddy current	5,000	NR		x				4	12	
Aviation M	EO14	13	1/9/04	6/30/05	New Equipment	Zetech ultrasonic	5,000	NR		x				5	13	
Aviation M	EO15	13	1/9/04	6/30/09	New Equipment	Engine Laboratory	100,000	NR		x				6	14	
Aviation M	M01	13	1/9/04	6/30/05	Replacement Equipment	Ignition systems	17,000	R		x			1		15	
Aviation M	M02	13	1/9/04	6/30/05	Replacement Equipment	Lubricating systems	5,000	R		x			2		16	
Aviation M	M03	13	1/9/04	6/30/05	Replacement Equipment	Propellers	50,000	NR		x			3		17	
Aviation M	M04	13	1/9/04	6/30/05	Replacement Equipment	Aircraft manuals upgrades	5,000	R		x			4		18	
Aviation M	M05	13	1/9/04	6/30/05	Replacement Equipment	Fuel systems	2,000	R		x			5		19	
Aviation M	M06	13	1/9/04	6/30/05	Replacement Equipment	Finishing systems	25,000	R		x			6		20	
Aviation M	M07	13	1/9/04	6/30/05	Replacement Equipment	Cabin atmosphere controls	2,500	R		x			7		21	
Aviation M	M08	13	1/9/04	6/30/05	Replacement Equipment	RTS- General equipment	120,000	R		x			8		22	
Aviation M	M09	13	1/9/04	6/30/05	Replacement Equipment	Campus sheet metal equip	50,000	R		x			9		23	
Aviation M	M10	13	1/9/04	6/30/05	Replacement Equipment	Turbine powerplants	167,000	NR		x			10		24	
Aviation M	M11	13	1/9/04	6/30/05	Replacement Equipment	Instrumentation	35,000	R		x			11		25	
Aviation M	M12	13	1/9/04	6/30/05	Replacement Equipment	Ice & rain control aircraft (2)	300,000	NR		x			12	7	26	
Aviation M	M13	13	1/9/04	6/30/05	Replacement Equipment	Ice & rain control	15,000	R		x			13		27	
Aviation M	M14	13	1/9/04	6/30/05	Replacement Equipment	Rigging assembly systems	25,000	R		x			14		28	
Aviation M	M15	13	1/9/04	6/30/05	Replacement Equipment	PA 28-140 complete	25,000	NR		x			15		29	
Aviation M	M16	13	1/9/04	6/30/05	Replacement Equipment	Cessna 152 - complete	20,000	NR		x			16		30	
Aviation M	M17	13	1/9/04	6/30/05	Replacement Equipment	Cessna 210 - fuselage mock up	4,500	NR		x			17		31	
Aviation M	M18	13	1/9/04	6/30/05	Replacement Equipment	Cessna 310 - complete	30,000	NR		x			18		32	
Aviation M	M19	13	1/9/04	6/30/05	Replacement Equipment	Piper PA 28-151, damaged	10,000	NR		x			19		33	
Aviation M	M20	13	1/9/04	6/30/05	Replacement Equipment	Rockwell T39A, operational	100,000	NR		x			20		34	
Aviation M	M21	13	1/9/04	6/30/05	Replacement Equipment	Hughes 269 Helicopter	10,000	NR		x			21		35	
Aviation M	M22	13	1/9/04	6/30/05	Replacement Equipment	Hiller Helicopter	25,000	NR		x			22		36	
Aviation M	M23	13	1/9/04	6/30/05	Replacement Equipment	Bell UH-1H helicopter	200,000	NR		x			23		37	
Aviation M	M24	13	1/9/04	6/30/05	Replacement Equipment	Cessna 182 - complete	35,000	NR		x			24		38	
Aviation M	M25	13	1/9/04	6/30/05	Replacement Equipment	Hydraulics	25,000	R		x			25		39	
Aviation M	M26	13	1/9/04	6/30/05	Replacement Equipment	General equipment	20,000	R		x			26		40	
Aviation M	M27	13	1/9/04	6/30/05	Replacement Equipment	Demonstration engines	80,000	NR		x			27		41	
Aviation M	M28	13	1/9/04	6/30/05	Replacement Equipment	Overhaul equipment	52,000	NR		x			28		42	